

### REMARKS

Claims 1-10 and 12-15 are pending in this application. By this Amendment, Applicants amend claims 1 and 12, cancel claim 11 and adds new claims 13-15.

Claims 1, 2, 8, 11 and 12 were rejected under 35 U.S.C. § 102(b) as being anticipated by Inai et al. "Doped Channel HFET. . ." And claims 3-7, 9 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Inai et al. Applicants respectfully traverse these rejections.

Claim 1 has been amended to recite:

"A field-effect semiconductor device comprising:  
a channel layer;  
a contact layer;  
a semiconductor structure having an electron-affinity different from those of the channel layer and the contact layer and formed between the channel layer and the contact layer, the semiconductor structure having a first junction face between the semiconductor structure and the channel layer and having a second junction face between the semiconductor structure and the contact layer;  
an ohmic electrode formed on the contact layer; and  
a Schottky electrode formed on the semiconductor structure;  
**wherein at least one of the first junction face and the second junction face is an iso-type herterojunction; and**  
**the semiconductor structure is composed of a single material."**  
(Emphasis added)

The Examiner alleged that Inai et al. teaches all of the features recited in claim 1 of the present application including an n-InGaAs channel; a "semiconductor structure" comprising an n-AlGaAs intermediate layer adjacent the contact, an undoped AlGaAs barrier layer and a lightly doped n-GaAs layer adjacent the InGaAs channel; and n-GaAs contact double layer.

However, Inai et al. teaches a device in which every heterojunction provided therein is an aniso-type heterojunction, such as i-AlGaAs/n-GaAs. Inai et al. fails to teach or suggest any heterojunctions which are iso-type heterojunctions, and certainly fails to teach or suggest "at least one of the first junction face and the second junction face is an iso-type herterojunction" as recited in claim 1 of the present application.

In addition, as clearly seen in Fig. 1 or Inai et al., the semiconductor structure of Inai et al. includes an n-AlGaAs intermediate layer, an AlGaAs barrier layer, and a GaAs

layer. Thus, the semiconductor structure of Inai et al. includes layers which are made of **different** materials, **NOT** the same material. Therefore, Inai et al. clearly fails to teach or suggest a semiconductor structure that "is composed of a single material" as recited in claim 1 of the present application.

Accordingly, Applicants respectfully submit that Inai et al. fails to teach or suggest the unique combination and arrangement of elements recited in claim 1 of the present application.

New independent claim 15 recites additional features which are not taught or suggest by the cited prior art.

In view of the foregoing remarks, Applicants respectfully submit that claims 1 and 15 are allowable. Claims 2-10 and 12-14 depend upon claim 1, and are therefore allowable for at least the reasons that claim 1 is allowable.

In view of the foregoing Remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are respectfully solicited.

To the extent necessary, Applicants petition the Commissioner for a Two-month extension of time, extending to October 20, 2002, the period for response to the Office Action dated May 20, 2002.

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The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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**VERSION WITH MARKINGS SHOWING CHANGES MADE**

1. A field-effect semiconductor device comprising:  
a channel layer;  
a contact layer;  
a semiconductor structure having an electron-affinity different from those of the channel layer and the contact layer and formed between the channel layer and the contact layer, the semiconductor structure having a first junction face between the semiconductor structure and the channel layer and having a second junction face between the semiconductor structure and the contact layer;  
an ohmic electrode formed on the contact layer; and  
a Schottky electrode formed on the semiconductor structure;  
wherein [the first junction face between the channel layer and the semiconductor structure and the second junction face between the contact layer and the semiconductor structure are iso-type heterojunctions; the channel layer and the semiconductor structure at the first junction face are each formed of doped layers; the contact layer and the semiconductor structure at the second junction face are each formed of doped layers; and the semiconductor structure includes an undoped layer intermediate the doped layers thereof] at least one of the first junction face and the second junction face is an iso-type herterojunction; and  
the semiconductor structure is composed of a single material.

12. A field-effect semiconductor device according to claim [11] 14, wherein the channel layer and the doped layer of the semiconductor structure at the first junction face are each n-type doped layers, and the contact layer and the doped layer of the semiconductor structure at the second junction face are each n-type doped layers.